UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,893	08/28/2006	Paul Gothard Knutson	PU030237	3761

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/590,893	KNUTSON ET AL.
	Examiner	Art Unit
	ALEXANDER JAMAL	2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 October 2008</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-27</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Based upon the submitted amendment entered via RCE, the examiner notes that claims 1-

21, 23-26 have been amended and claim 27 has been added.

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it
> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

2.   **Claims 1-27** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the enablement requirement. The claim(s) contains subject matter which was not described in

the specification in such a way as to enable one skilled in the art to which it pertains, or with

which it is most nearly connected, to make and/or use the invention.

The claims recite an entertainment (non-training) audio signal sampled at a higher

sampling rate than the first sampling rate of the input microphone. Applicant's specification

does not disclose any means or relationships between sampling rate of the incoming microphone

signal (telecommunications signal) and the 'higher sampling rate' of the non-training audio

signal. Applicant does not show a sampling stage in any of the submitted figures. Additionally

it is not clear how the 'non-training' signal is presented to the user if it is not converted to an

analog signal to be driven out of the speaker (in order to perform the claimed 'training function'.

Applicant's specification does not specify if/when/where the signal is converted to analog. Is

applicant claiming an 'entertainment audio signal' that is transmitted out to though the speaker in

digital form? That does not make sense as that would not be a very 'entertaining' signal. The

examiner contends that applicant's specification does not provide enough information for one

skilled in the art to discern how the 'entertainment signal' is actually used to train the canceller.

Is it converted to analog/ left in digital? For the purpose of examination, the examiner assumes

the claims are referring to the inherent step of matching the sampling rates of the training-signal

(entertainment signal) with the signal-to-be-modified-via-the-training signal (the

telecommunications signal input from the mic) for the inherent purpose of aligning up the

samples so that accurate adaptations can be made.

        The phrase delay matching buffer' is used in the claims. As per applicant's submitted

remarks (page 10), the applicant has traversed the examiner's contention that using delay buffers

to synchronize a system is not well known and obvious in the art. As such the examiner makes

an enablement rejection to applicant's claims that recite the delay matching buffers as applicant's

specification does not provide enough information for one skilled in the art to ascertain the

desired delay and further how to compensate for said delay. How is one to determine the delay

when applicant has not disclosed all functional blocks of the interface? Further, applicant has

not provided any sampling rates or relative timings of time-diagrams or any clocking stage

details? What is the master clock run at? How does the buffer compensate for master clock

jitter? What is each processing stage clocked at? Applicant's specification does not give any

circuit /signal specific implementation from which to glean exactly how the delay buffer

operates. For the purpose of examination, the examiner assumes (as previously assumed) that

synchronizing the processing stages of a device using delay buffers is an inherent step in **any**

digital bidirectional communications device used for performing 'real-time' communication

(telecommunications). Further it is well known and obvious that the delay buffer stages could be

implemented anywhere along feedback/transmission path as a matter of design choice.

As per **claims 1,6,7,8,27,** the examiner notes that applicant has refuted the examiner's

contention.that it is well known and obvious to manage resources. Based on applicant's

arguments (remarks page 13), the examiner notes that applicant has not provided any specific

details as to how the system would monitor the total load on the processor (or even every process

handled by said processor) Further the applicant has not providing any timing diagrams or

algorithms by which the processor determines the 'average load'.

Furthermore, the examiner notes that it is not disclosed how the claimed inhibiting of the

adaptive filter/ audio training application is performed in view of the well known function of a

double-talk detector, which also limits the filter adaptation.

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

2.   **Claims 1-27,** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

        The claims use the phrase 'entertainment' to describe an application, and a sound

adaptor. It is not clear what specifically defines an 'entertainment sound adaptor' or an

'entertainment application'. Applicant's specification does not clearly define the phrases.

For the purpose of examination, the examiner assumes that any type of audio signal or

audio signal processing means (application/sound adaptor) may be considered

'entertainment'.

        As per **claims 6-8,27,** it is not clear what 'minimizing' the use of a processor

would entail. Since applicant's spec does not provide and specific implementation

details, it is not possible to discern what load would be considered 'minimized'. Further ,

it is not clear what an 'average load' for a given processor would be considered to be.

Again, applicant's specification is very sparse when it comes to actual implementation

details. Which is why the examiner read these items as obvious in the prior office action.

        For the purpose of examination, the examiner assumes the above items are well

known and obvious steps to take when designing any processor based system.

        Clarification/correction is requested.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   **Claims 1-4,9-15,20-22,27** rejected under 35 U.S.C. 103(a) as being anticipated by Nyhart

et al. (5553137).

        As per **claims 1,12,** Nyhart discloses an acoustic echo canceller (Col 1 lines 21-

40) that trains on 'non-training' audio. The system inherently comprises an A/D sampler

to sample the incoming microphone signal because the system is digital. However,

Nyhart does not specify the sampling rate of the audio signal in relation to the audio of

the telephone functions

        The examiner contends that it would have been obvious to one of ordinary skill in

the art that any number of signaling frequencies could have been chosen for the telephone

and audio signal used for training, or realize that the training could occur at a different

clock rate than telephone signaling as a matter of design choice.

        As per **claim 10,** it is rejected as per **claim 1,** Nyhart discloses that the dialing

tones (preset signals that are used to notify of an event unrelated to training that are also

used for training) (Col 1 lines 45-60).

As per **claims 2,13**, they are rejected as per claim 1.

As per **claims 3,11,14,22,** it may be audio.

As per **claims 4,15,** examiner reads any device that processes audio with acoustic echoes as a computer, portable computer, and a phone.

As per **claims 9,20,** the examiner contends that any initialization stage for a communications device would inherently comprise and indication to the training portion as to when to start (a number of training calls being reached) for the purpose of telling the training when to start. Additionally the examiner contends that once the echo has been reduced to an acceptable threshold, the system inherently comprises a counter (clocking) in order to signal the rest of the system that the training has been completed. This counter would be adaptive, since it is based on the echo canceller being trained.

3.   **Claims 23-26,5,16,7,8,18,19,** rejected under 35 U.S.C. 103(a) as being unpatentable over Nyhart (5553137) as applied to claims 1,12.

As per **claim 23,** it is rejected as per the claim 1 rejection, however Nyhart doesn't disclose the specifics of the terminal where the echo canceller is implemented.

It would have been obvious to one of ordinary skill in the art at the time of this application that an echo canceller could be implemented on a phone (which is also a conferencing device) or computer with a known interface (USB,1394) that produces the external audio signal for training for the purpose of removing echoes from those devices.

As per **claims 24-26,** they are rejected as per the claim 1 rejection.

As per **claims 5,16,** Nyhart discloses the audio training signal for the canceller which is digitally processed. As such, the system inherently comprises an analog-to-digital converter, which will sample the training audio in the same microphone input that receives the telephone signaling (for a conferencing application for example). The ADC inherently comprises a 'sample rate converter' which will resample any input signal into the preset sampling rate (which will be the same as the telephone signaling (conferencing application).

As per **claim 7,8,18,19,27,** examiner contends it would have been obvious to balance and manage the processor resources in a given system as necessary to perform the disclosed functions of communicating and echo cancelling.

4.   **Claims 6,17** rejected under 35 U.S.C. 103(a) as being unpatentable over Nyhart (5553137) as applied to claims 1,12, and further in view of applicant's admitted prior art (spec).

As per **claims 6,17,** Nyhart's system comprises a speaker, and mic (fig. 1), but does not give specifics of the echo canceller.

Applicant's admitted prior art discloses well known adaptive filters used to perform the echo cancelling. The digital system inherently comprises means to delay all signals paths so as to synchronize the signals (to give 'real time' bidirectional

communication.) (spec pages 1 and 2). It would have been obvious to one of ordinary skill in the art at the time of this application to implement well known echo canceller features like a filter and delay means for the purpose of implementing the disclosed canceller.

Response to Arguments

1.   Applicant's arguments have been fully considered but they are moot in view of the new grounds of rejection.

        As per applicant's argument that Nyhart does not disclose the adaptive filter stage, the examiner maintains that applicant's admitted prior art discloses adaptive filters, and further that Nyhart's disclosed echo canceller inherently comprises an adaptive filter to perform the echo estimation inherent to echo cancellation.

        As per applicant's arguments that Nyhart does not disclose the delay buffers, the examiner notes the 112 rejection above. Applicant is arguing about claim elements that are detailed in applicant's specification. Applicant has provided no details to enable the specific implementation of an 'adaptive filter'. The examiner contends that an adaptive filter is a very well known stage that is inherent to all echo cancellers.

        As per applicant's arguments that the prior art relied upon by the examiner (applicant's disclosed prior art) teaches away from the disclosed processor. The examiner maintains the 103 rejection and contends that one of ordinary skill would realize that prior art systems existed and could benefit from obvious combinations, such as the one with Nyhart.

As per applicant's arguments that examiner has not shown a citation in a reference for the inherent delay stages in the system. The examiner contends that it is well known to buffer and delay processing stages in order to synchronize realtime bidirectional communication systems. The examiner further notes that applicant has not disclosed the implementation specifics of any of the claimed device (such as lines of code for a dsp or actual circuit routing of the claimed device). The examiner contends it is well known how to implement functions and algorithms digitally, using processing, buffering and delay stages for the purpose of implementing the disclosed synchronized bidirectional communication systems.

As per applicant's argument that Nyhart's background section teaches away from applicant's claims, the examiner does understand applicant's argument and requests clarification. The examiner maintains that Nyhart reads on applicant's claims as per the above rejections.

As per applicant's argument that Nyhart's noise sequence is not a 'specially designed audio sequence' as recited in applicant's claims, the examiner disagrees.

As per applicant's argument's that Nyhart does not disclose training during a telecommunications application. The examiner notes that the noise sent during the ringing/dialing signal in Nyhart's system does read on applicant's claims as written and further notes that a phone ringing/dialing is a 'telecommunications application'.

As per applicant's argument that Nyhart is not disclosing the same 'entertainment signal' as claimed by applicant. The examiner notes the 112 rejection above, and further notes that applicant's specification has not clearly defined what differentiates an 'entertainment' signal from any other signal. The white noise generated by Nyhart may also be used for 'entertainment' (white noise is relaxing !). Applicant argues that the entertainment signal is not a training signal,

but that is **exactly** what the entertainment signal is as claimed by applicant. Applicant's

specification does not clearly define an entertainment signal. Entertainment is in the eye of the

beholder and applicant cannot claim what may or may not be entertainment on a case by case

basis.

As per applicant's arguments about the examiner using hindsight, the examiner refutes

that comment and notes that the claims are being read as enabled by the specification, and the

specification is not clear on what differentiates an 'entertainment' signal from any other audio

signal. The examiner reads any audio signal as entertainment because it is not possible to

differentiate that from non-entertainment. Likewise, even signals specifically implemented for

training, could be considered 'musical entertainment' if they are enjoyed by the listener.

As per applicant's argument regarding claim 9, the examiner notes the new rejection

above.

As per applicant's contention that white noise does not contain a series frequencies, the

examiner strongly disagrees and contends that white noise in entirely comprised of frequency

components.

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner

can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization

where this application or proceeding is assigned are **571-273-8300** for regular communications

and **571-273-8300** for After Final communications.

/Alexander Jamal/

Primary Examiner, Art Unit 2614

Examiner Alexander Jamal

December 24, 2008